

by another, except that this type of hand-off requires much more complex technical events involving communications between the MTSOs using dedicated landline trunk facilities, over which the cellular call is then routed.

10. For PCS, however, the intersystem hand-off problem is magnified as compared with existing cellular systems by the larger (MTA-wide) PCS license areas. Most MTAs are much larger than the Cellular Geographic Serving Areas ("CGSAs") originally licensed by the FCC for cellular services, even as those areas have been expanded through subsequent FCC orders (and expanded, from a decree viewpoint, through interLATA calling scope waivers under Section VIII(C)). Thus, for example, the Milwaukee MTA contains all or part of seven LATAs, and due to the LATA boundary configurations, several such boundaries might well be crossed during a single call. (See Attachment 1 hereto).
11. Without interLATA hand-off relief, it will be impossible for PCS PrimeCo or any other PCS provider operating under the decree to offer anything approaching seamless service within its licensed areas, even under the decree's cellular calling scope waivers. In addition, PrimeCo will be much less attractive to other wireless providers for roaming agreements if it cannot perform interLATA hand-offs. These other providers will not want their customers to be exposed to the inconvenience, annoyance and unnecessary expense which result from dropped calls, at invisible LATA boundaries which are not known to the customers. The competitive detriment to our systems, which must confront firms which have no such hand-off impediment at all, will be very great.
12. In addition to hand-offs among its own systems, i.e., MTSOs, PrimeCo will in some cases need to hand off calls on an interLATA basis to others' wireless systems at the borders of the MTAs which it serves. Such external

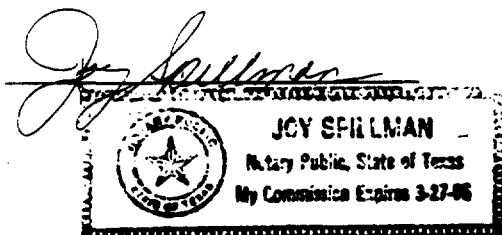
hand-offs, like those among PrimeCo's own systems within its MTAs, are essential to provision of the seamless service which wireless users expect, and which is often a large part of the reason they become wireless customers in the first place. These hand-offs will be accomplished in the same manner technologically as are PrimeCo's internal hand-offs, and as cellular hand-offs are today.

13. In the current technological environment, it is not possible to provide equal access in the hand-off process, i.e., to use the customers' presubscribed interexchange carrier ("PIC") to provide the interLATA link between the MTSOs involved. The precise timing of the events which must occur, and the speed at which they must happen, to accomplish a hand-off effectively require the use of dedicated MTSO-to-MTSO trunks and prohibit the use of the public switched telephone network, which equal access would require.
14. The IS-41 standard represents a substantial feat of telecommunications engineering, but it was not designed for and cannot realistically accommodate the use of switched connections. And the technical difficulty of any attempt to do this would be increased further by the need to accomplish hand-offs among the disparate wireless technologies which will be in use, such as CDMA and Time Division Multiple Access ("TDMA"), Groupe Special Mobile ("GSM"), etc.
15. Moreover, the expense to customers of converting a local call into a long-distance one, at retail rates under equal access, would often be unexpected, unpredictable and substantial. These factors would create a strong disincentive to use PrimeCo's services and those of any other PCS provider laboring under the same disability, from which the ultimate losers would be wireless customers.

16. Nor would it be feasible either from an engineering or an economic view point for each interexchange carrier to provide dedicated MTSO-to-MTSO trunks for hand-off purposes. They certainly would have no incentive to do so. It is thus impossible today to incorporate equal access into the hand-off process, as the interexchange carriers themselves recognize. (See MCI Response to Extension of Cellular Intersystem Handoff Waiver, filed September 8, 1995, at 2).
17. In summary, PrimeCo will provide cellular services, including hand-offs, in the same way and with the same cellular architecture and technology as existing cellular systems. PrimeCo's network will be physically separated from the landline telephone networks, as are today's cellular systems, and will interconnect with the landline networks in the same way as cellular systems do today. The only technical difference between PrimeCo's services and existing cellular services will be the electromagnetic frequency bands in which PrimeCo operates. PrimeCo will have an even greater need to perform interLATA hand-offs than current cellular systems because of its larger service territories. And equal access cannot be included in the hand-off process. The authority sought here is essential to PrimeCo's ability to provide the service demanded by wireless customers, and to its ability to compete effectively in the wireless marketplace.

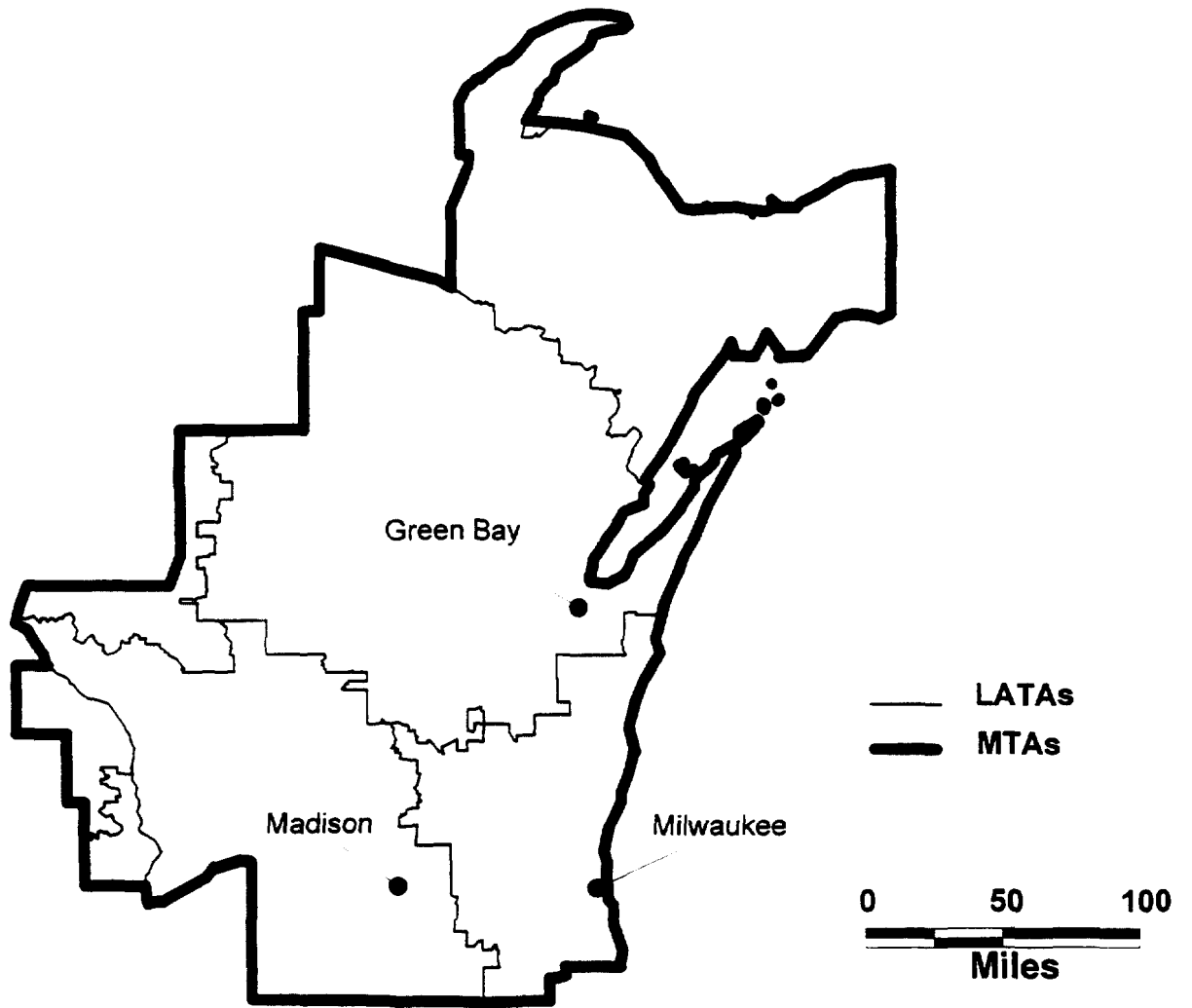

Hamid Akhavan

Subscribed and Sworn
to before me this 16~~th~~ day
of October, 1995.



Attachment 1

Milwaukee MTA



AFFIDAVIT OF EVAN B. RICHARDS

1. My name is Evan B. Richards. I am Vice President - Network Planning of Ameritech Mobile Communications Inc., referred to as Ameritech Cellular Services ("ACS"). My business address is 2000 W. Ameritech Center Drive (Room 3F28), Hoffman Estates, Illinois 60195.

2. I have a Masters Degree of Business Administration from Ohio State University and a Bachelors Degree in Electrical Engineering from Ohio Northern University.

3. I have spent the past 31 years in a variety of management positions focused on all aspects of conventional telephone, paging, cellular and Personal Communications Services (PCS). I was responsible for directing the design, implementation, optimization, operation and evolution of the very first commercial cellular systems in the nation. During this career, I have consistently been promoted to positions of increasing responsibility.

4. As Vice President - Network Planning for ACS, I am responsible for all technical aspects related to the design, implementation, optimization and operation of ACS' wireless network, including its cellular and paging operations and its new PCS operations. Also, as President of Ameritech Wireless Inc., a holding company for Ameritech Corporation ("Ameritech") PCS licenses, I coordinated the PCS strategy efforts in preparing a business plan and auction strategy for both narrowband PCS and broadband PCS.

Overview of ACS and its Wireless Plans

5. ACS is a wholly owned subsidiary of Ameritech. It has majority ownership, and therefore responsibility for operations, in the following cellular partnerships:

Illinois: Chicago SMSA Limited Partnership

Illinois SMSA Limited Partnership

Illinois RSA 6&7 Limited Partnership

Michigan: Detroit SMSA Limited Partnership

Missouri¹: Cybertel Cellular Telephone Company

Cybertel RSA Cellular Limited Partnership

Ohio: Cincinnati SMSA Limited Partnership

Wisconsin: Milwaukee SMSA Limited Partnership

Madison SMSA Limited Partnership

In all of these foregoing markets, ACS is the “B-side” carrier in terms of frequency spectrum license except in the Missouri partnerships where ACS is the “A-side” carrier.

Ameritech participated in the FCC spectrum auctions last year and early this year for broadband PCS licenses. It was awarded a 30 MHz license in the following markets:

Ohio: Cleveland Major Trading Area (MTA)

Indiana: Indianapolis MTA

Charts showing these new coverage areas are included in Attachment 1. Ameritech also is planning to participate in future FCC Basic Trading Area (BTA) auctions.

Ameritech has turned-over management of its new PCS license areas to ACS for implementation and operation. ACS has established its presence in these new PCS market areas by forming an initial management organization for each area and by reselling existing cellular services under the “Ameritech” brand. While ACS is currently leaning toward an upbanded (1900 MHz) CDMA infrastructure to serve its new PCS areas, a final decision has not been made yet. It is expected that implementation will be undertaken once the CDMA technology has “proven” successful in cellular deployments taking place in 1995 and 1996.

¹ Includes Kauai

Description of Technology

6. Since PCS is, for the most part, an upbanded version of cellular (Mobile) service, ACS supports the request that the handoff waiver granted for cellular be extended to PCS. The standards that have been developed for cellular CDMA (800 MHz) are being used with some modification in the development of standards for PCS CDMA (1900 Mhz). Likewise, the standards that have been developed for cellular TDMA are being used for PCS TDMA service, except for the frequency band in which it is expected to operate.

In cellular CDMA, mobile stations will be capable of operating in the CDMA domain where coverage is provided and also work in the AMPS (analog) domain where CDMA coverage is not provided. Thus, mobile stations will be “dual mode” and enjoy the benefits of broad coverage. In a like manner, PCS CDMA mobile stations will be dual mode and “dual band” (i.e., operating at 1900 MHz or 800 MHz) so that CDMA service can be provided in PCS CDMA coverage areas, defaulting to cellular CDMA coverage areas where available or AMPS (analog) mode when CDMA coverage is not available.

The IS-41 Revision C “Cellular Radiotelecommunications Intersystem Operations” standard, which is currently undergoing a ballot (approval) process, was developed to support the various cellular air interface standards (AMPS, NAMPS, CDMA, TDMA). These standards are expected to also support PCS CDMA and PCS TDMA air interface standards, and a Technical Service Bulletin (TSB) to IS-41 Revision C is expected to be the mechanism by which any incremental changes for PCS requirements could be documented. In recognition of the similarities between cellular and PCS, there has been movement recently within the TIA Standards, specifically TR45 (Mobile) and TR46 (PCS), to merge the efforts of certain PCS standards into Mobile standards.

7. IS-41 Revision A is the standard currently widely deployed to support intersystem operations. The section of the standard pertaining to intersystem handoff procedures shows that a mobile unit moving from one system to another system may be routed from the new serving system MTSO on a direct trunk to the initial system (or

“anchor system”) MTSO. If this new serving system happens to be situated in a different LATA, then the call traverses a LATA boundary without using switched InterLATA services². There would be numerous problems associated with attempting to include switched IXC services in the call routing path, such as: (1) the time delay in establishing an IXC connection during is a very fast handoff procedure (i.e., virtually “seamless” to the end users), (2) the availability of the originating end user’s Primary Interexchange Carrier (PIC) at the new serving system when the new serving system carrier provides equal access service, and (3) the potential for repeated setup and collapse of this new path if the end user moves into and out of the anchor system and new system during the same call. Billing issues and intercompany settlements would be made significantly more complex by a requirement to include an IXC in the handoff scenario, not only when the mobile user initiated the call but also when the mobile user was the recipient of a call.

IS-41 Rev. C will be the emerging new standard for Intersystem Operations, and handoffs will occur similar to that described above for IS-41 Rev. A. Selection of an IXC during a handoff process is not included in the IS-41 Rev. C standard.

Need for Waiver

8. ACS seeks an interpretation or extension of the cellular handoff waiver to cover PCS handoffs so that PCS end users can be afforded seamless services when moving from one LATA to another. Seamless handoffs would not be the case if intersystem handoffs had to make provision for IXC selection and routing. PCS handoffs will follow the same procedure whether calls are originating by, or terminating to, the mobile end user, and whether the call starts out as an IntraLATA call becoming an InterLATA call or vice versa. In other words, the same technical standard is applied to all PCS handoff scenarios and does not differentiate in favor of a wireless carrier that is subject to MFJ and equal access guidelines.

² It is likely that an Interexchange Carrier (IXC) is providing the connecting transmission facility.

The circumstances that create a need for a clarification or waiver include the following:

(1) Handoff standards do not allow for IXC selection and routing during the handoff process. The time delay alone in setting-up a switched connection could be too late for a successful handoff to occur. Many wireless carriers currently use MF inband signaling between switches, and each trunk in the call path could take several seconds. Even if LECs and IXCs use SS7 out-of-band signaling for call setup, an end-to-end connection could be quite lengthy. The end user impact of dropped calls could be significant.

(2) Even if handoff standards to support IXC selection and routing during the handoff process were developed and implementation were technically feasible, the economics of such an arrangement could be significant. At a time when the courts, the FCC and Congress are promoting competition, this action could be detrimental to RBOC-based wireless carriers. Instead of a direct trunk path between two MTSOs, the call would have to be routed from the new serving system MTSO to a Local Exchange Carrier (LEC) tandem, from there to an IXC switch, from there to another IXC switch, from there to the LEC serving the anchor system, and, finally, from there to the anchor MTSO.

(3) The billing, intercompany settlements and other administrative complexities could be significant. As noted previously, the end user may move in and out of the home system, causing a multiplicity of billing records to be initiated. Further, the end user may be unaware that a LATA boundary is being crossed unless some warning is given. If the end user finds one or several "toll" calls being charged for what was presumably an IntraLATA call, there could be a high incidence of customer complaints. Conversely, if the end user was the recipient of an IntraLATA call and moved to another LATA and if the new serving system was able to route the call via IXC services, the end user would again find one or several "toll" calls being charged when only airtime charges would normally be expected.

Evan Richards
(Signature)

SWORN AND SUBSCRIBED

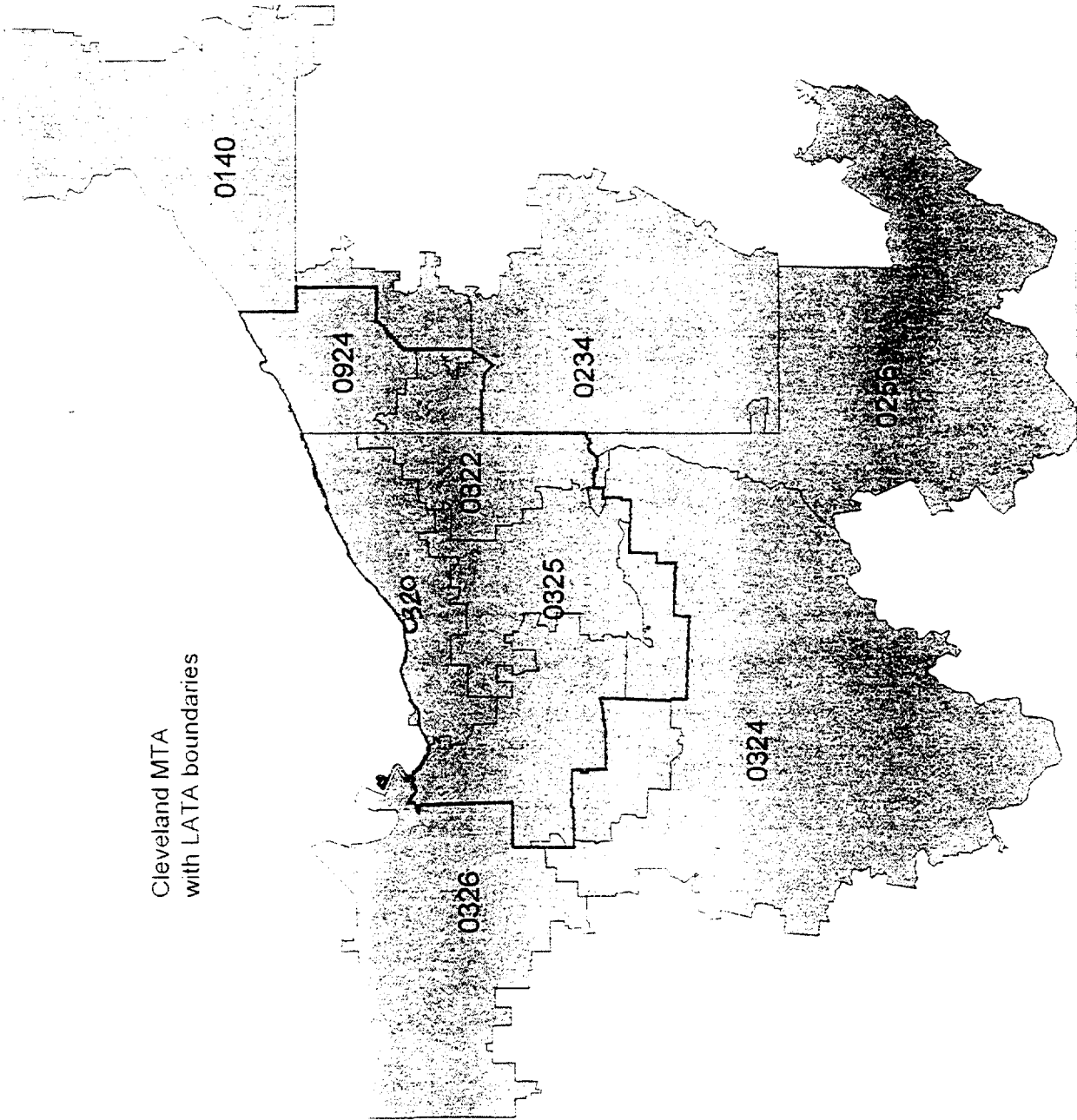
before me this 18th day of October, 1995

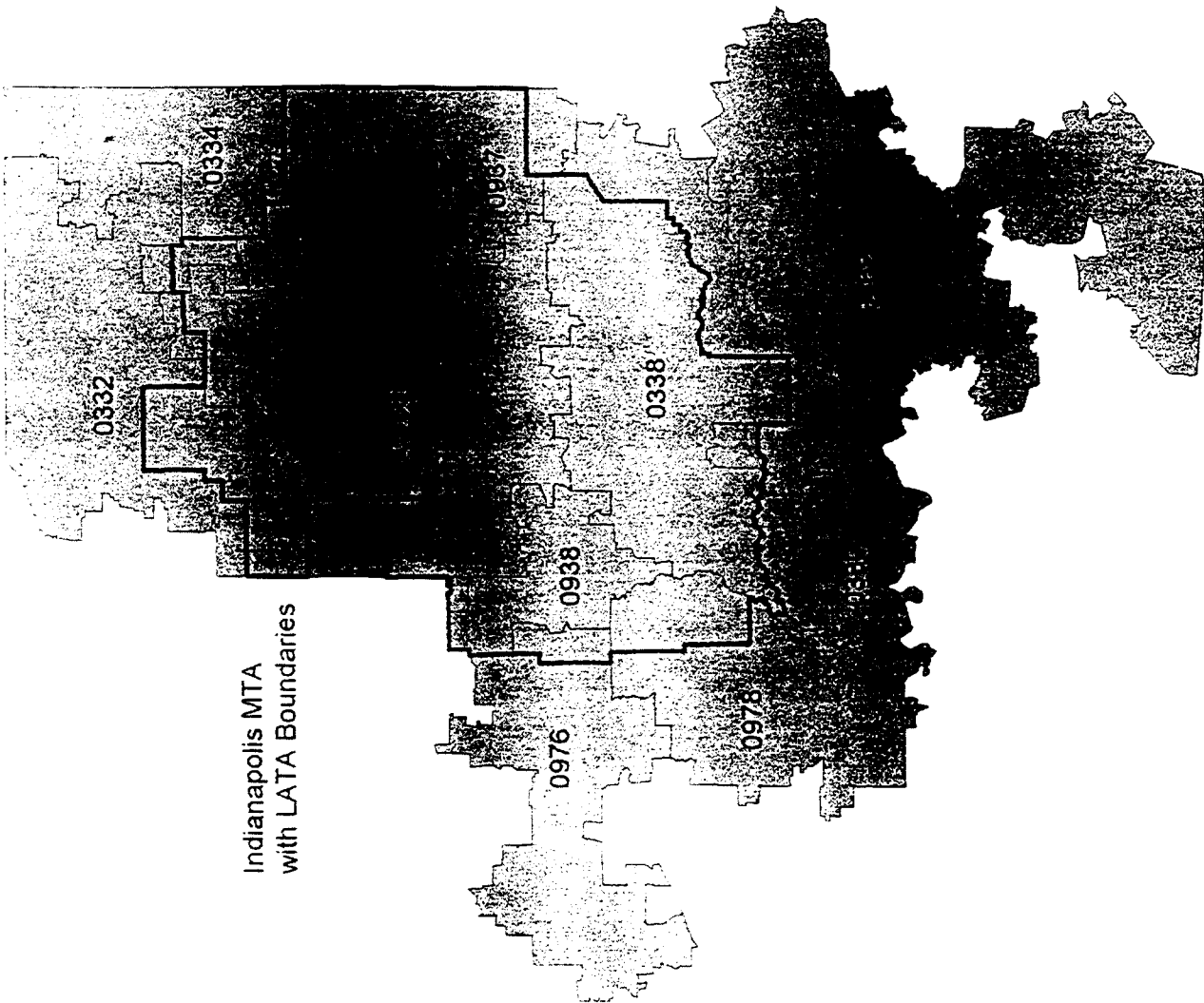
Patricia E Driscoll
Notary Public

My Commissions expires: 5/9/99



Cleveland MTA
with LATA boundaries





DECLARATION OF STEVEN SIDORE

I, Steven Sidore declare:

1. I am the Director of Network Engineering and Operations for Pacific Bell Mobile Services ("PBMS"). I am responsible for all of the network design, engineering, switching, and operations of our PCS service in Northern and Southern California Metropolitan Trading Areas. I have an Bachelor of Sciences degree from UCLA in Electrical Engineering and a Masters in Business Administration from Santa Clara University. I have a diverse background in telecommunications at Pacific Bell from operations to engineering strategy, design and technology implementation over the past fourteen years. The last four years have been in the development of wireless technology and services for PCS. My specific responsibilities include the development of new PCS/wireless technologies, technology selection and network design for intelligent network and switching systems.

2. Intersystem call hand-off is very important to our customers. If it is done properly the customer is never aware that the call has been passed from one system to another, and the customer is able to complete its call. If it cannot be done due to MFJ limitations, the call will be dropped at great inconvenience to the customer.

3. The PCS Architecture PBMS has chosen, is PCS-1900/GSM. Our PCS switch, known as a mobile switching center ("MSC"), will be involved in performing a hand-off when a customer moves between adjacent cells at switching borders. These borders may be controlled by separate switching entities or by partitioned switches within the same PBMS serving system or by a different provider's system. The intricacies of hand-off are essentially the same for PCS as for existing cellular systems.

4. PBMS's PCS-1900 system uses a protocol called GSM-MAP (Global System for Mobile communications - Mobile Application Part). This protocol, also known as IS-652, identifies all the internal system linkages required to maintain the call during hand-off. It also provides information to coordinate linkages with the adjacent mobile system.

5. The PCS network is physically separate from Pacific Bell's landline network. Some PCS equipment will be located on Pacific Bell property. For example, the MSCs will often reside in Pacific Bell central offices in physically distinct space from the landline switches. The only interconnection between the wireline and wireless systems will be the interconnection that is required between the wireless and wireline networks for completion of calls to any type of subscriber, whether wireless or wireline. This is true for any wireless architecture, be it traditional cellular or PCS. PBMS will use the same types of interconnection that are available to all wireless carriers.

6. Although GSM-MAP (IS-652) and IS-41 are different protocols, their application for intersystem hand-off is the same. Like IS-41, GSM-MAP is not capable of going back through the landline network to initiate an intersystem hand-off using the customer's primary interexchange carrier.

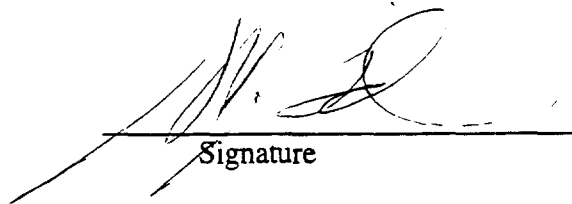
7. Call hand-off is an intricate process that requires precise timing and coordination between wireless equipment and the mobile station. To achieve intersystem hand-off between MSC switches via a customer's PIC would involve extra switching, new software development and call set-up time. The call would travel from the MSC to the access tandem to an IXC's POP, over the IXC's network to its POP in the adjacent territory, to the access tandem, then to the MSC, to the access tandem again and to the end office serving the called party. In all probability the call would be dropped. This would occur because the additional switching would add multiple seconds to a process that needs to happen in less than a second for digital technologies. The additional steps needed to provide an interLATA link would exceed the time available to make the hand-off work.

8. Call hand-off is particularly important to PCS because of the size of the licensed territories. Pacific Bell Mobile Services is licensed to provide service in two Metropolitan Trading Areas ("MTAs") - one covering Northern California and part of Nevada and the other covering Southern California, part of Nevada and a small part of Arizona. As shown in Exhibit I, each MTA is very large and encompasses several LATAs. The Northern California MTA contains part or all twelve LATAs (nine in California and three in Nevada). The Southern California MTA contains part or all of nine LATAs (five in California and four in the Nevada and Arizona portion of the LATA). Consequently, the need for hand-off will occur on an interLATA basis within the MTA more frequently than within the much smaller cellular serving area. Cellular serving areas are generally confined to one or two LATAs. Absent a waiver for hand-off, PBMS would be forced to discontinue calls in progress at LATA boundaries even within its licensed service territory because of the technical inability to hand the call off to the customer's selected interexchange carrier.

9. Because the caller is mobile, a call with a duration of several minutes may go through several interLATA hand-offs. For example, if a car is traveling on a road that borders on a LATA boundary, the call may cross back and forth over the LATA boundary during the duration of the call. If equal access were required, the caller could experience a multitude of long distance charges, if the call survived all the extra switching. This is technically infeasible for the network; even if such hand-offs were possible, the billing settlements would be an administrative nightmare due to long distance charges being incurred each time the car crossed a LATA boundary.

10. There is no technical reason to treat PCS and cellular service differently with respect to hand-off. If PCS were to be treated differently than cellular, PCS would be at an enormous competitive disadvantage. Customers would become very frustrated with their service.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

A handwritten signature in black ink, appearing to be "M. D.", is written over a horizontal line. Below the line, the word "Signature" is printed in a serif font.

Signature

Executed on September 22, 1995



AFFIDAVIT OF CHERYL J. BLUM

Cheryl J. Blum, being duly sworn, deposes and says:

1. I am currently vice chair of the TR 45.2 Subcommittee of the Telecommunications Industry Association ("TIA"), and chair of Working Group II of that Subcommittee. I have been vice chair of the Subcommittee since May of 1994, chair of Working Group II since 1992, and a member of the Subcommittee since 1991. TIA is actively involved in setting standards for a wide variety of telecommunications products, the TR 45.2 Subcommittee deals with cellular radio system operations, and Working Group II has responsibility for network issues relating to wireless automatic roaming and handoff.

2. In addition, I am currently a Member of Technical Staff in the Wireless Standards Development and Industry Relations Department of the Network Wireless Systems Business Unit of the Network Systems Group of AT&T Corp. In this capacity, my responsibilities include representing AT&T Corp. in wireless standards development industry bodies. I received my bachelor's degree in the Liberal Arts in Mathematics from Bradley University in 1970, and a master's degree in Computer Science from Northwestern University in 1977.

3. In 1991 and 1992, the chair of the TR 45.2 Subcommittee, John A. Marinho, submitted three affidavits (attached hereto as Addenda A, B, and C) in connection with the request of the Department of Justice for comments on the status of equal access technology for intersystem handoff. I have reviewed, and concur with, those affidavits, and I submit this affidavit to update the information provided in those affidavits. In discussing the matters in this affidavit, I am reporting the consensus of the members of the Subcommittee, as I understand it, and not necessarily my personal views or those of my employer.

4. Although, since 1991 and 1992, there have been enhancements to the IS-41 signaling protocol to accommodate digital technologies in the handoff context, nothing has changed to alter the conclusion set forth in the attached affidavits of Mr. Marinho. In particular, as Mr. Marinho explained, IS-41 was not designed for use of the customer's PIC in the intersystem handoff of a call from one MTSO to another. Addendum A, ¶¶ 16-18. As when Mr. Marinho filed his affidavits, such arrangements, although technically possible, would, at this time, result in a very inefficient network design. Since Mr. Marinho filed his affidavits, no suggestions regarding equal access in the

handoff context have been brought to the Subcommittee's attention.

Cheryl J. Blum
Cheryl J. Blum

Sworn to and subscribed before me this 10th day
of Aug., 1995.

Mary Ann Water
Notary Public



Addendum A

AFFIDAVIT OF JOHN A. MARINHO

John A. Marinho, being duly sworn, deposes and says:

1. I am currently chairman of the TR 45.2 Subcommittee of the Telecommunications Industry Association (TIA). TIA was formed in April 1988, by a merger of the United States Telecommunications Suppliers Association and the Information and Technologies Group of the Electronic Industries Association. It is a full service trade organization that represents nearly 600 companies in the telecommunications industry. Among its many other functions, TIA is actively involved in setting standards for a wide variety of telecommunications products. In addition, through its association with other domestic and international standards-setting organizations, TIA plays an important role in the international standards-setting process.

2. TIA has a number of technical committees devoted to standards issues. These committees deal with products in four general areas: user premises equipment, network equipment, mobile communications equipment, and fiber optic equipment. In each of these four areas, there are subcommittees responsible for specific standards setting activities. The TR 45.2 Subcommittee deals with cellular radio system operations. As Chairman of the TR 45.2 Subcommittee, I am responsible for conducting the affairs of the Subcommittee, as they relate to standards setting, in accordance with the rules and guidelines of the TIA.

3. In addition to my chairmanship of the TR 45.2 Subcommittee, I am the Supervisor of the Cellular Network Planning and Standards Group within the Cellular Systems Division at AT&T Bell Laboratories in Whippany, New Jersey. I have responsibilities for Systems Engineering regarding AT&T's present and future wireless telecommunications systems. In this capacity, I arrange for AT&T representation at meetings of TIA/EIA TR 45 Committees, T1 Committees, CCIR and CCITT. I have worked at AT&T since 1985. I received my B.S. degree in Electrical Engineering from the New Jersey Institute of Technology, in 1980, and a Masters degree in Business Administration from Rutgers University, in 1985.

4. The general purpose of this affidavit is to describe the standards-setting process and to explain how IS-41 became the accepted industry standard for intersystem handoff and automatic call delivery. I will also discuss the technical issues at this time associated with the use of a customer's presubscribed interexchange carrier (PIC) either to effectuate intersystem handoff or to exchange the administrative information necessary for automatic call delivery. In discussing these matters, I will report the consensus of the members of the Subcommittee, as I understand it, and not necessarily my personal views or those of my employer.

The Standards-Setting Process

5. The standards-setting committees of TIA, including the TR 45.2 Subcommittee, are open to attendance by representatives of companies in all segments of the cellular industry -- manufacturers, cellular license holders (both wireline and non-wireline), long

distance carriers, and related hardware and software concerns. Anyone with an interest can participate in the standards-setting process.

6. The TR 45.2 Subcommittee operates under guidelines of the American National Standards Institute (ANSI)¹ to ensure that standards are promulgated in accordance with a due and fair process. The process works on the basis of consensus, and the standards adopted are wholly voluntary. As explained in section 6.2 of the TIA Engineering Manual, "[t]echnical standardization work of the TIA consists of discussion in an open forum by technical representatives from a wide spectrum of industry, leading to a consensus on electrical, mechanical, environmental, quality, reliability and other properties of telecommunications components, equipment and systems."

7. There are approximately 50 organizations represented on the TR 45.2 Subcommittee, including AT&T, GTE Mobilnet, Ericsson, McCaw Cellular, MCI, Motorola, and SNET Cellular. Presently seven of these members are from mobile affiliates of the Bell companies. All the members of the Subcommittee have an equal vote.

IS-41

8. Cellular service in any given area is provided by a Mobile Telecommunications Switching Office (MTSO) linked to a number of cell sites. Service within the territory served by any given MTSO is "seamless." That is, calls are handed off from one cell site to the next as a mobile customer is in transit. Calls are initiated from and delivered to whatever cell site is providing the strongest radio signal to the mobile unit at the time call setup is required. Wherever a customer may be within the MTSO's service area, the customer should receive the same level of service.

9. The major engineering challenge facing the cellular industry in recent years has been to link disparate MTSOs in much the same way as cells within a single MTSO's territory are linked. The goal is to provide seamless nationwide service so that a mobile customer can receive the same service in a foreign system as the customer enjoys in the customer's home system. If a cellular customer can make calls while in a foreign system ("roamer calls"), receive calls wherever the customer may be physically located ("call delivery"), and keep calls in progress from being disconnected when the customer moves from one system to another ("intersystem handoff"), then matters of franchise ownership become irrelevant to end users.

10. Until recently the incompatibility of different manufacturers' switching equipment presented a major obstacle to both call delivery and intersystem handoff. For example, a switch by one manufacturer could not handoff a call to one manufactured by another.

1. ANSI is the coordinator of the private-sector administered voluntary standards system in the United States, with a membership of more than 1,200 companies, 250 professional technical, trade, labor, and consumer organizations, and 20 government agencies. ANSI is also the official U.S. representative to major non-treaty international standardizing bodies, such as the International Organization for Standardization and the International Electrotechnical Commission.